

Physiological Limnology: An Approach to the Physiology of Lake Ecosystems. By H. L. Golterman. Volume 2, *Developments in Water Science*. Elsevier Publishing Company, Amsterdam, 1976. 489 pp. 151 D.F. (approximately \$62.50).

Golterman describes his book, intended for postgraduate students of limnology, as a "first approach to relating the chemical environment with the biochemistry and physiology of the organisms in a quantitative way." The objective is achieved via a rather thorough synthesis of current literature on limnology (e.g., good coverage through 1973 and a sampling of more recent papers) augmented by the author's considerable experience. Where detailed information on a particular topic cannot be included, the reader is directed to an appropriate reference or review paper. The reference index is good and cross-referencing of sections within the text prevents excessive duplication and allows the reader to begin with any subject matter. The book is quite readable, editing has been almost flawless, and the photographs, though few, are excellent.

Most of the subject matter deals with the relationship between physicochemical characteristics of lakes and the biochemistry and physiology of algae (e.g., pigment characteristics, photosynthesis, nutrient uptake, and production). Only approximately 6% of the text concerns bacteria, 5% zooplankton, and 1% fish. The remainder (about 14%) is directed toward case histories (e.g., Lake George and Loch Level, two IBP lakes) and application of limnological knowledge to eutrophication and water management problems. Methodology and justification for use of specific techniques are treated rather extensively, but ^{14}C coverage is a bit light for this reviewer's taste. The coverage is distinctly and understandably biased toward the Netherlands, Eurasia, Africa, and the Americas, in that descending order. That the author is less familiar with North American limnological literature is evident in the location of "Lake Washington (Florida, USA)," and the statement that "at present drinking water is no longer on tap but supplied in bottles" in Los Angeles is simply incorrect information. However, this focus may prove to be most impor-

tant to American limnologists by providing them with a more cosmopolitan viewpoint.

Physiological Limnology will be of greatest value to the phycologist just entering the field of limnology or the limnologist who desires to augment his knowledge of algal physiology and biochemistry. Statements on phosphorus and nitrogen limitation and sedimentation require mature interpretation so that they don't appear dogmatic. Certainly, most freshwater ecologists and particularly graduate students will find the contents worthwhile. Unfortunately, the very high list price will greatly limit its distribution and use as a class text.

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Radioecology and Energy Resources, Proceedings of the Fourth National Symposium on Radioecology, May 12-14, 1975, Oregon State University, Corvallis, Oregon. Edited by Colbert E. Cushing, Jr. Dowden, Hutchinson & Ross, Inc., Stroudsburg, Pennsylvania, 1976. 401 pp. \$25.00.

Symposium proceedings provide an opportunity to learn about current research and to become familiar with new techniques. Symposia bring together researchers based on a central theme and usually encourage them to report their findings sooner than usually would occur through other means of publication. This symposium accomplishes, more or less, these objectives. The quality of the reports is good and the scope of the methods and procedures reflects most of the recent advances in radioecological research. The theme of this, the Fourth National Symposium on Radioecology, focuses upon the increasing role of nuclear energy in total energy requirements and upon the radioecological implications of energy resource development. This book presents the Proceedings of the Fourth National Symposium held at Oregon State University, Corvallis, Oregon, on May 12-14, 1975. These proceedings contain 57 papers divided into five broad areas. Not all papers presented at the symposium appear in this volume. Only

those papers which were most scientifically oriented to the theme of the symposium were published after having received outside review. This process of review by authorities, in their fields of research, has contributed much to the quality of the papers in this book.

In addition to the two plenary session papers constituting Part I, there are four parts to the book containing the scientific contributions. In Part II, the papers are concerned with the radioecological problems associated with the development of energy sources. All but one of these papers deal with the distribution, accumulation, and ecological behavior of the radionuclides ^{60}Co , ^{137}Cs , ^{54}Mn , ^{65}Zn , ^{233}U , ^{238}Pu , ^{240}Pu , ^{241}Am , and ^3H in the terrestrial, freshwater, and marine environments. One paper relates to problems arising from chlorination of cooling water from nuclear power plants. The papers in Part III report modeling and methodological contributions to environmental studies. Of the 12 papers, five pertain to modeling and seven to methodology. The application of radiotracer techniques to new problems is continuing while the use of modeling in the field of ecology has been increasing at a relatively rapid rate. Papers in Part IV pertain to cycling of radionuclides in aquatic and terrestrial ecosystems. Uptake, retention, and excretion are discussed for the radionuclides ^{45}Ca , ^{47}Ca , ^{60}Co , ^{137}Cs , ^{59}Fe , ^{54}Mn , ^{32}P , ^{85}Sr , and ^{65}Zn . The importance of physiochemical forms of elements and specific ac-

tivity are considered and concentrations in organisms are reported. Effects of radiation on terrestrial and aquatic organisms and communities is the subject of Part V. Papers on radiation effects have constituted a small portion of the total papers presented at all four symposia on radioecology. Of the six papers in this section, only one pertained to effects on communities; the other papers reported research carried out on single species irradiated with beta and gamma radiation to determine radiosensitivity and survival.

This book provides an opportunity to keep abreast in the field of radioecology. It should be pointed out that since nuclear power plants have been found to add only small quantities of radionuclides to the environment and since other sources, such as fallout, to the environment have been reduced, there has been some loss of interest in the general field of radioecology. This is unfortunate, however, since contamination of the environment by radionuclides for any number of reasons remains a possibility, and a need for experts in this field is always present. While the combined subject matter covered by the papers in this book makes it a must for radioecologists and others interested in radionuclides in the environment, I cannot consider it essential reading for the fishery scientist.

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